THE STIGMATA OF DEGENERATION.

—BY—

FREDERICK PETERSON, M. D.,

Consulting Neurologist to Randall's Island Hospital for Idiots; Consulting Physician to the Manhattan State Hospital for the Insane; Chief of Clinic, Nervous Department, Vanderbilt Clinic, College of Physicians and Surgeons, New York; Clinical Professor of Insanity, Woman's Medical College of the New York Infirmary.

Reprint from the State Hospitals Bulletin for July, 1896.

UTICA, N. Y.
UTICA STATE HOSPITAL PRESS.
1896.

THE STIGMATA OF DEGENERATION.

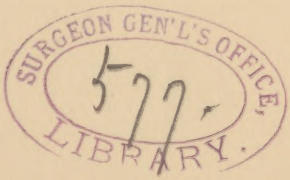
By Frederick Peterson, M. D.,

Consulting Neurologist to Randall's Island Hospital for Idiots; Consulting Physician to the Manhattan State Hospital for the Insane; Chief of Clinic, Nervous Department, Vanderbilt Clinic, College of Physicians and Surgeons, New York; Clinical Professor of Insanity, Woman's Medical College of the New York Infirmary.

The subject of degeneracy in the human race has for some years been exciting much interest and discussion among scientific men. Unusual facilities have been afforded the writer for the study of this condition in connection with work in reformatories, prisons, asylums and institutions for idiots, and he believes that a thorough understanding of the various indices of degeneration would be of value not only to physicians in institutions of the character mentioned, but also to the general practitioner who is frequently brought into contact with degenerates outside of institutions, and commonly at so early a period in life—during childhood or adolescence—that he may often do an untold amount of good by calling attention to an indication of a degenerative proclivity in some member of a family, a discovery occasionally of enormous significance as regards prophylaxis, education and care.

Degeneracy may be defined as a marked deviation from the normal original type or standard. We recognize it as a rule in its effects upon the intellectual life, in the deviations from the intellectual habits and social conduct which we hold in common with our fellows. To the class of degenerates not only belong many criminals, idiots, and insane individuals, but also the great majority of persons whom we call cranks or eccentrics,—the people who live among us a sort of original life, with peculiarities of mental habit and conduct, and whom we characterize as feeble-minded, odd, quaint, queer or singular.

A man of talent or of genius often presents eccentricities of the kind to which we refer, but such deviation from the original normal standard need not be morbid in character;



it may be a deviation toward a higher and better standard recognized by his contemporaries or posterity to be such, and to which we, on our part, try in the end to conform. It might be difficult at times to distinguish between the eccentricities of genius and the eccentricities of degeneracy. There are one or two indications or tests which will aid us in this. One of the indications, in fact the chief test of a normal state is naturally conformity to the social condition in which a man lives. This test applied by itself, however, does not exclude talented individuals and geniuses. Another criterion must be applied to these cases. Is there conjoined with the eccentricity a morbid self-centering of his interests? It is in individuals who concern themselves little with the affairs of the world, but much with personal and selfish matters, that eccentricity of intellectual habit or conduct warrants a grave diagnosis. Now one of the essential characteristics of degeneracy is its inclusion of transmissible elements, so that the degenerate individual not only bears in himself the germs which render him more and more incapable of fulfilling his own functions in human life, but by his hereditary bequests he menaces the intellectual stability of his descendants.

So much for the definition of the term degeneracy. We will now pass on to a consideration of the indications of degeneracy.

Stigmata of Degeneration.

The indications of degeneracy are known as stigmata-hereditatis or stigmata of degeneration. They may be defined as anatomical or functional deviations from the normal, which in themselves are usually of little importance as regards the existence of an organism, but are characteristic of a marked or latent neuropathic disposition. Much study has of late years been devoted to these indices by many investigators, particularly in their relation to insanity, idiocy, and criminal anthropology, and it behooves all who have to do with the development and care of the human body in any particular,—and this refers espe-

cially to men of the medical and allied professions,—to familiarize themselves with these signs of degeneration in so far as they concern their own special provinces of work. These stigmata are vices of functional and organic evolution. The deviations from the normal may be in the way of excesses or arrest of development. They must be distinguished from the deficiencies or deformities produced by accidents at birth or by disease. I have said that these stigmata are anatomical and functional. But it is more convenient to divide the functional group into physiological and psychic classes. It is the latter which we are more apt to observe in our social relations with degenerate individuals. The psychic stigmata are always characterized by a want of balance or lack of proportion between certain undeveloped or excessively developed faculties and other faculties which are normal. Defect of moral sense, of attention, of memory, will, judgment, or unbalanced excess of musical or mathematical aptitudes may be cited as instances of psychic stigmata. Hence the three following divisions may be made of all of the degenerative indices:

(1) Anatomical stigmata.
(2) Physiological stigmata.
(3) Psychical stigmata.

Anatomical Stigmata.

Cranial anomalies.
Facial asymmetry.
Deformities of the palate.
Dental anomalies.
Anomalies of the tongue and lips.
Anomalies of the nose.
Anomalies of the eye: Flecks on the iris, strabismus, chromatic asymmetry of the iris, narrow palpebral fissures.
Albinism.
Congenital cataracts.
Microphthalmos.
Pigmentary retinitis.
Muscular insufficiency.

Anomalies of the ear.
Anomalies of the limbs: Polydactyly.
Syndactyly.
Ectrodactyly.
Symelus.
Ectromelus.
Phocomelus.
Excessive length of the arms.
Anomalies of the body in general: Hernias.
Malformation of the breasts, thorax.
Dwarfishness.
Giantism.
Infantilism.
Feminism.
Masculinism.
Spina bifida.
Anomalies of the genital organs.
Anomalies of the skin: Polysarcia.
Hypertrichosis.
Absence of hair.
Premature grayness.

Physiological Stigmata.

Anomalies of motor function: Retardation of learning to walk.
Tics.
Tremors.
Epilepsy.
Nystagmus.
Anomalies of sensory function: Deaf-mutism.
Neuralgia.
Migraine.
Hyperæsthesia.
Anæsthesia.
Blindness.
Myopia.
Hypermetropia.

Anomalies of sensory function: Astigmatism.
Daltonism.
Hemeralopia.
Concentric limitation of the visual field.

Anomalies of speech: Mutism.
Defective speech.
Stammering.
Stuttering.

Anomalies of genito-urinary function: Sexual irritability.
Impotence.
Sterility.
Urinary incontinence.

Anomalies of instinct or appetite: Uncontrollable appetites (food, liquor, drugs.)
Merycism.

Diminished resistance against external influences and diseases.

Retardation of puberty.

PSYCHICAL STIGMATA.

Insanity.
Idiocy.
Imbecility.
Feeble-mindedness.
Eccentricity.
Moral delinquency.
Sexual perversion.

Having attempted to classify the various stigmata in this manner, we may now proceed to a consideration seriatim of the anatomical and physiological anomalies above described:

Cranial Anomalies.—These I have treated of fully in another article to which the reader is referred (American Journal of Insanity, July, 1895).

Briefly they consist of asymmetry of the cranium and of

various deformities, such as microcephalus, hydrocephalus, leptocephalus, scaphocephalus, trigonocephalus, plagiocephalus, and the like.

Facial Asymmetry.—Inequality of the two sides of the face—when congenital and not due to some such disease as hemiatrophy—is to be looked upon as a stigma of degeneration. In the same category may be grouped various irregularities, and such conditions as excessive prognathism or retrognathism. Great prominence, or unequal prominence, of the malar bones is to be observed, and also asymmetry of the orbits.

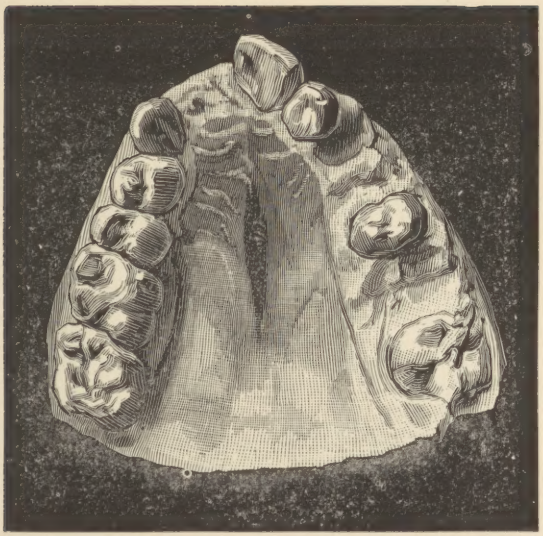
Deformities of the Palate.—In connection with the soft palate, bifurcation of the uvula may be mentioned.* As regards the hard palate, I have dwelt upon its deformities at some length in an article in the International Dental Journal (Dec., 1895), and the facts there brought forward may be recapitulated as follows:

While the palate occupies but a small place in this great category of hereditary stigmata of all kinds, it is one of the anatomical group, and this group is for many reasons the one of greatest importance. In this group, too, it occupies a distinctive place as being among the most striking, frequent and significant of the anomalies. I will not say of the palate what Dr. Amadée Joux said of the ear, "show me your ear and I will tell you who you are, whence you came, and where you go;" but I will say, "show me your palate, and I will probably be able to tell whether you belong to the great class tainted by heredity, comprising many insane, imbecile, feeble-minded, criminal, eccentric, epileptic, hysterical, or neurasthenic individuals.

The arch of the hard palate presents considerable variation within strictly normal anatomical limits. A large, wide, moderately high vault is what may be called a normal standard. It means the highest evolution, judging from the fact that the mouth cavity increases in capacity as we ascend the vertebrate series. Deviations from that

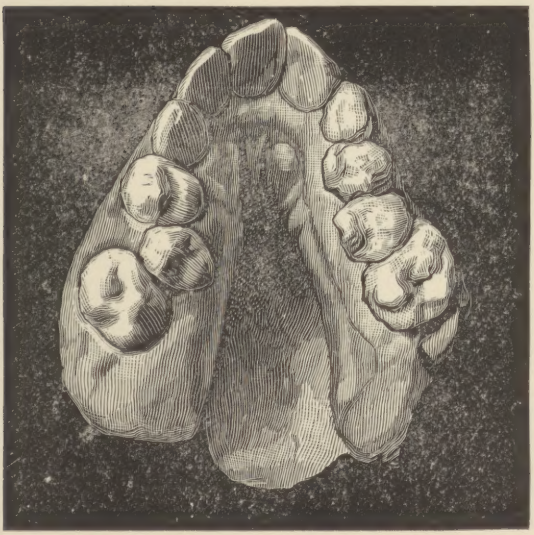
*Dana on Deformity and Paralysis of the Uvula—*Am. Jour. of Insanity*, April, 1896.

FIG. 1.



Palate with Gothic arch.

FIG. 2.

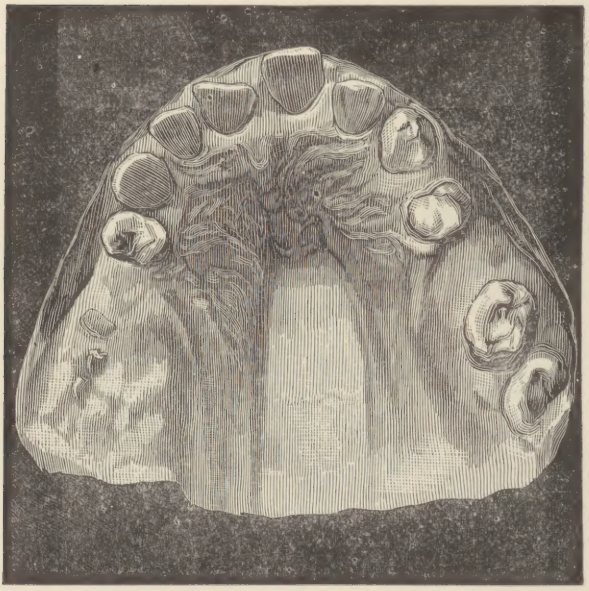


Palate with horseshoe arch.

FIG. 3.

The dome-shaped palate.

FIG. 4.

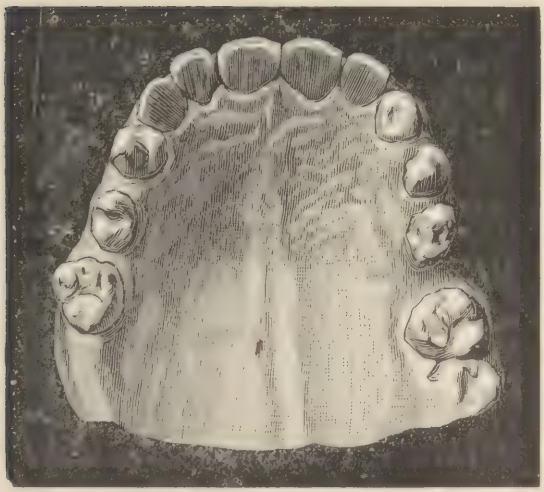


The flat-roofed palate.

FIG. 5.

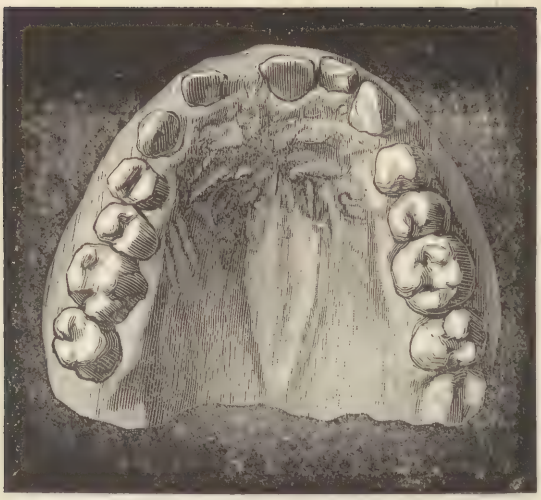
The hip-roofed palate.

FIG. 6.



The asymmetrical palate.

FIG. 7.



Torus Palatinus. (Broad, wide torus.)

standard are not at all infrequent, and yet such deviations may be normal. Thus the palate may be low and broad, or it may be high and narrow; it may be short or long in its antero-posterior diameter. It may be ridged unduly along the palatine sutures, or it may present marked rugosities on its surface, especially in the anterior region; yet these variations are normal. Probably we may look upon these peculiarities as a species of compensatory development. Just as in a study of heads we find some very long and low, and others short and round and high, and recognize the fact that the shortness in one dimension is compensated for by a corresponding increase in another; so we may regard variation in palatine diameters.

The pathological palate has not been studied as much as it deserves to be. Save occasional and casual references to the "Gothic" palate in literature, and one or two papers upon the torus palatinus, very little has been written upon the subject. In my paper referred to above, I have attempted to classify such pathological palates as could be justly looked upon as indicative of degeneracy. The word Gothic having been so long in use, and the hard palate being much like an arch or roof,* I have followed architectural nomenclature in the classification offered.

Pathological palates:

(1) Palate with Gothic arch.
(2) Palate with horseshoe arch.
(3) The dome-shaped palate.
(4) The flat-roofed palate.
(5) The hip-roofed palate.
(6) The asymmetrical palate.
(7) The torus palatinus.

The seven varieties named are to be looked upon as types merely. Each type will be found to present variations and combinations with other forms. Thus the Gothic arch may have a low or high pitch and be short or long.

* There is some confusion in literature of the roof of the mouth, or hard palate, referred to in this paper, with the dental arch, which is quite another thing.

The horseshoe arch (a familiar one in Moorish architecture) is always easily distinguished, but, owing to its conformation, a cast can not well be taken of it to show it in perfect outline. The dome-shaped palate may be high or low, may be combined with asymmetry or torus. The presence of a torus in the Gothic variety is apt to destroy the purely Gothic form, and may cause it to resemble the flat-roofed palate. Under the heading of flat-roofed palate I should include all such palates as are nearly horizontal in outline (of which I have not a good specimen to exhibit), as well as those with inclined roof sides but flattened gable. In the hip-roofed palate we have the sloping sides as usual, but also a marked pitch of the palate roof in front and behind; occasionally one may meet with a palate of this kind with so remarkable a pitch from before backward, that it is almost like a Gothic roof turned about so that the gable runs transversely. Asymmetry in the palate is commonly observed in many of the previously described forms, but occasionally is the only noteworthy peculiarity. It is usual to find asymmetry of the face and skull in cases with an asymmetrical palate. The torus palatinus (Latin torus, swelling) was first mentioned by Chassaignac as a medio-palatine exostosis. It is a projecting ridge or swelling along the palatine suture, sometimes in its whole length, sometimes in only a portion of its course. It is always congenital. It varies considerably in its shape and size, so that as many as five or six different species of torus are recognized. It may be wedge-shaped, narrow, broad, very prominent, or irregular. I have said nothing about cleft-palate, for I am not sure that it may be classed among the well marked stigmata of degeneration. I have found but two or three cleft-palates among the four hundred and fifty idiots and imbeciles on Randall's Island, while a number of cases of this kind with which I have come in contact in my professional life were very far from degenerates. However it would seem that there is great need of a faithful study of a large number of cases of cleft-palate, in relation to the question of

degeneracy. The deformed palate is to my mind one of the chief anatomical stigmata of degeneration. It is true that from this single indication, it would not be strictly scientific to adjudge an individual a degenerate. Occasionally perhaps a case presents itself where this anatomical stigma alone would suffice to ensure a diagnosis of this nature, but usually other stigmata co-exist, such as cranial anomalies, deformities of the ear, and the like. The frequency of the pathological palate among marked degenerates, such as the insane, idiots and epileptics, has been testified to by many investigators. Thus Talbot reported 43% of abnormal palates in 1,605 inmates in institutions for the feeble-minded. Ireland makes it nearer 50%. Charon, a later writer than these, found abnormal palates in 10% of apparently normal people, in 82% of idiots and feeble-minded, in 76% of epileptics, in 80% of cases of insanity in general, in 70% of the hysterical insane, and in 35% of cases of general paralysis. Näcke has studied particularly the torus palatinus in 1,449 individuals, normal and psychopathic; he found it present in 23.9% of psychopathic women (insane, epileptic, idiot, and criminal), 32.9% of epileptic women, 34.4% of criminal women, 22.7% of normal women.

The percentages were smaller in men than in women. A narrow torus is more common than a broad one.

Stieda examined 1,500 skulls for the torus from an anthropological point of view. The skulls were of Prussians, Armenians, Africans, Frenchmen, Russians, and Asiatics. He decided that it has no anthropological significance, gives no racial distinction. While the torus is undoubtedly of value as an index of degeneration, particularly where it is well marked, it probably has less importance in this respect than some of the other forms of pathological palate.

Dental Anomalies.—Among anomalies of the teeth are macrodontism, microdontism, projecting teeth, badly placed or misplaced teeth, double row of teeth, or teeth which are striated transversely or longitudinally. Caries of the teeth and Hutchinson's teeth are due to neglect or disease. The

latter, however, may often be considered as a stigma of degeneration. Then there is a retardation of the first and second dentition.

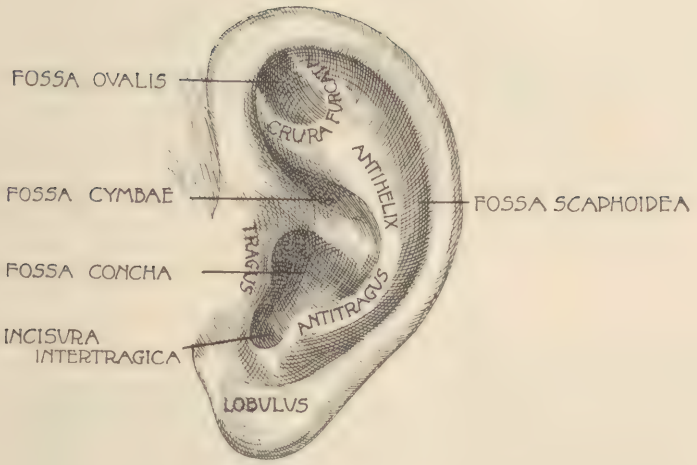
Anomalies of the Tongue and Lips.—A very large tongue (macroglossus) is not infrequently observed among the lowest classes of degenerates, as in idiocy. Sometimes there is microglossus, asymmetry of the two halves, or bifidity of the point. Hare-lip is somewhat more common than cleft-palate, but, like the latter, its exact standing as a degenerative stigma is not fully determined. Undue swelling or puffiness of the lips is noteworthy.

Anomalies of the Nose.—Marked deviation of the nose to one side or the other should be noted. Taken alone it may possess little significance, but in conjunction with other stigmata, it has value. The nose may be absent, or present defect of osseous development (nasus aduncus), or atresia of the nasal fossae.

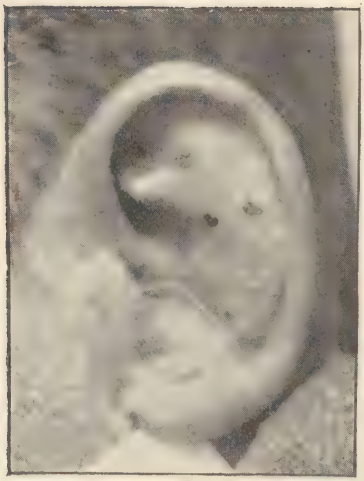
Anomalies of the Eye.—The pathological conditions of the eye have been placed in two groups in the above classification, since some are anatomical and some physiological. To enumerate them altogether, they are as follows:

Anatomical.	Physiological.
Flecks on the iris.	Blindness.
Strabismus.	Myopia.
Chromatic asymmetry of the iris.	Hypermetropia.
Narrow palpebral fissures.	Astigmatism.
Albinism.	Daltonism.
Congenital cataracts.	Hemeralopia.
Pigmentary retinitis.	Concentric limitation of the visual field.
Muscular insufficiency.	Nystagmus.
Microphthalmos.	

It is true that any one or two or more of these conditions present do not certainly indicate degeneracy, but they are significant in connection with other abnormal states, and all of them are more frequently observed in degenerate individuals, especially the lower orders, than in normal


FOSSA OVALIS
FOSSA CYMBAE
FOSSA CONCHA
INCISVRA INTERTRAGICA
CRURA FURCÆ
ANTIHELIX
FOSSA SCAPHOIDEA
TRAGUS
ANTITRAGUS
LOBULVS

NORMAL EAR

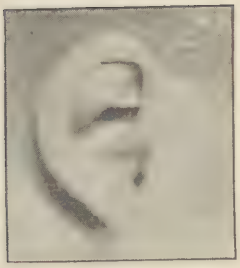


No crus superius; no anthelix; small fossa conchæ; few details of ear.

No lobule; almost no fossa concha; shallow fossa scaphoidea; fusion of helix, anthelix and antitragus. A type of Stahl ear No. 3.

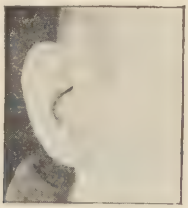
Darwin ear in an epileptic.

Prominent anthelix; mal developed helix; absence of lobule; diminution of the concha. Wildermuth ear No. 1.



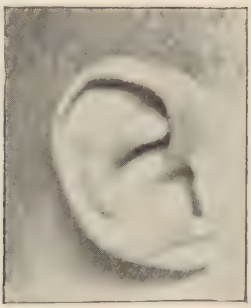
Broad band-like helix ; no anthelix ; no lobule ; excessive size of fossa cymbæ.

Excessive length of ear; fusion and distortion of helix, anthelix, antitragus and lobule.



Stahl ear No. 1.
Elephant ear.

Fissure in anthelix ; slight Darwin tubercle ; slight antitragus.



Triplication of crura furcata ; mal-formed helix and antitragus ; absent lobule.

Excessive length of ears; facial asymmetry.

Blainville ears, and also excessive length of ears.

Abnormal implantation of ears; too marked conchoidal shape. The Morel ear.

persons. In idiots, convergent strabismus, due to defect of refraction and in conjunction with hypermetropia, is very common. Muscular insufficiency and nystagmus (lateral or rotatory) are also often met with in this class of cases. In paralytic and other idiots and imbeciles homonymous hemianopsia is sometimes met with.

Anomalies of the Ear.—Deformities of the ear have been deservedly well studied, for as stigmata of degeneration they take high rank, like anomalies of the hard palate, in the anatomical group. Morel, Stahl, Wildermuth, Binder and more recently Schwalbe, have given us especially good studies of these conditions. From their writings and my own studies, the following classification (following Binder) into twenty-two varieties may be made:

I. Abnormally implanted ears; they project too far or lie too closely, are placed too high or too low, too far forward or too far backward on the head.

II. Excessively large ears; (1), absolutely too large; (2), relatively too large in small or microcephalic individuals.

III. Ears which are too small.

IV. Too marked conchoidal shape of the ear. The details of the ear (anthelix and crura, etc.) are but slightly marked, while the helix outlines the ear like the rim of a funnel.

V. Ears which have a general ugly shape. The breadth of the upper part may exceed that of the lower and vice versa; excessive length; ears without lobules; unusually short ears.

VI. The ear not uniform in width; usually a long ear with one or more constrictions in its breadth.

VII. The Blainville ear; asymmetry of various kinds of the two ears. In most cases the asymmetry is due to an anomaly of the left ear.

VIII. The ear without lobule; there are usually other deformities of this ear besides the absence of lobule, such as too large a concha, prominence of the anthelix, etc.

IX. The ear with adherent lobule; the lobule is enlarged, adherent and inclines downward towards the cheek.

X. The Stahl ear No. 1 (See Zeitschrift für Psych., Vol. xvi). A series of anomalies of the helix. The helix is broad like a band and coalesces with the cartilages of the crura furcata. The fossa ovalis and fossa scaphoidea are scarcely to be seen. The lower half of the helix is obliterated. There are occasionally slight variations from this type.

XI. The Darwin ear; helix interrupted where its transverse portion passes into the descending, and at this point is a projection of the rim above and outward, like the pointed ear of lower animals.

XII. The Wildermuth ear (Würt. Corresp. Blatt, 1886, No. 40). The anthelix projects so far as to form the most prominent part of the auricle.

XIII. The ear without anthelix or crura furcata.

XIV. The Stahl ear No. 2. Multiplication of the divisions of the crura furcata, so that there are three instead of two crura.

XV. Wildermuth's Aztec ear. Lobule wanting; the whole ear seems pushed forward and downward; the crus superius of the anthelix coalesces with the helix, while its crus anterius is scarcely perceptible.

XVI. The Stahl ear No. 3. Only the crus anterius of the crura furcata is present, while the auricle seems divided into two halves by a ridge from the antitragus.

XVII. The ear with double helix.

XVIII. The ear with too large or too small a concha.

XIX. The ear with continuous fossa scaphoidea. The fossa passes down into the lobe.

XX. The Morel ear. A form marked by abnormal development of the helix, anthelix, fossa scaphoidea and crura furcata, so that the folds of the ear seem obliterated, and the ear is smooth, larger than usual, often prominent and with thin edge.

XXI. Ears misshapen by abnormal cartilage development. Here belong all irregular cartilaginous growths and thickenings except those caused by hæmatoma of the ear.

XXII. Various peculiarities, difficult to classify, are included here, such as abnormalities of the semilunar incisure of the tragus and of the meatus, colaboma of the lobule, hairiness of the different parts of the auricle, accessory ears, clefts, etc.

The most important malformations of the ear, those that may be regarded as belonging to the stigmata of degeneration, and those too which are striking and plain to the eye, are to be summarized as follows:

The deep position of the crus anterius.
Marked prominence of the anthelix.
Excessive broadening of the ear.
Stunted development of or absence of the helix.
Trifurcation of the anthelix.
Widening of the fossa scaphoidea.
Absence of the crus superius.
Complete absence of lobule.
Asymmetry of the two ears.
Excessive enlargement or diminution of the concha.
Excessive conchoidal structure of the ear.

Reference is occasionally made in literature to the Cagot ear. The Cagot is a species of cretin in the French and Spanish Pyrenees, in which one of the chief physical deformities is absence of the lobule of the ear.

Binder states that the adherent lobule exists in almost one-third of normal people, and in the photographs of several hundred distinguished people, 15% had abnormal lobules. At the same time more than twice as many adherent lobules are found in degenerates as in normal people.

Now with regard to the statistics of mal-formed ears in degenerate individuals, Wildermuth noted this condition in 41% of 142 idiots. Binder found 64% of degenerate ears in 354 insane persons. It is to be remarked, however, that Binder was more careful in his examinations, and by long practice had acquired more expert knowledge than Wilder-

muth. Fraenkel observed degenerate ears in 29 cases out of 32 with cranium proganæum.

Knecht found 20% of degenerate ears among 1,274 criminals, 27% among 48 epileptics, and 32% among 84 insane.

Binder noted degenerate ears in 33 persons outside of institutions, supposed to be normal individuals. Inquiring closely into their histories he discovered that 7 of them had insane parents, brethren or children, in 19 there were decided psychic abnormalities, and only 7 were apparently normal people. As regards heredity, it is very common for children to inherit ears with the identical characteristics of those of one or the other parent, but on the other hand, it is not uncommon for the ears of the children to be quite different.

Anomalies of the Limbs.—Paralysis, atrophy, retarded growth, club foot, and athetosis are conditions due to disease of the brain, and are observed in many cases of paralytic idiocy. These are not properly stigmata of degeneration, although they may be such under some circumstances, as for instance when club foot or club hand has a teratological origin. On the other hand there are anomalies having a hereditary character which are essentially degenerative indices. Among these may be mentioned congenital luxations, supernumerary fingers or toes (polydactyly), fusion of fingers or toes (syndactyly or aschistodactyly), excessive length of the arms as compared with the rest of the body and the lower limbs, missing fingers or toes (ectrodactyly), missing limb (ectromelus), fusion of the extremities (symelus or symmeles), or absence of parts of limbs so that they are excessively short (phocomelus). There may also be anomalous brevity of some digits as compared with the relative proportions of normal digits. Excessive volume of limbs (megalomelus) or of digits (megalodactyly) or excessive gracility of limbs (oligomelus) or of digits (oligodactyly) also deserves mention.

Anomalies of the Body in General.—Local malformations are naturally of more importance than general anomalies of the whole form, but it is necessary to study the relative pro-

Phocomelus of right arm in an epileptic girl. Right humerus several inches shorter than left. Movements of arms perfect on both sides.

portions of the entire figure from an anthropometrical point of view and to compare the results with normal standards. Excessive diminutiveness of figure as well as excessive or giant growth are indications of degeneracy. So too are infantile characteristics in an adult, feminine peculiarities in males and masculine traits in females. In this regard observations of the relative proportions of the shoulders and pelvis are particularly useful. The occult form of spina bifida with local hypertrichosis is met with. Deviation of the vertebral column among neuropaths is mentioned by Féré. They may be lordoses, scolioses, or kyphoses in various degrees. The coccyx may present peculiarities, such as simulation of a tail. Thoracic asymmetry or other deformity is observed at times. Absence of pectoral muscles or of muscles in various parts of the body have significance. Hernias are evidence sometimes of arrest of development of some part of the abdominal wall. Excessive development of mammary glands in males, or their absence or reduplication (polymastia) in either sex constitutes an evidence of degeneracy.

Anomalies of the Genital Organs.—Among the genital anomalies in males are cryptorchismus; unilateral or bilateral microrchidia; spurious hemaphroditism; insufficient development of the entire genital apparatus; hypospadias; epispadias; defect, torsion or great volume of the prepuce; median fissure of the scrotum; imperforate meatus.

In females the labia may be abnormally large, simulating a scrotum, sometimes very small. The clitoris may be exceedingly large. The labia minora may be hypertrophied. Sometimes there are intermediate folds between the labia minora and labia majora. The labia minora may be pigmented, particularly in brunettes and when they are hypertrophic. There may be imperforate vulva, or atresia of the vagina, or double vagina; uterus bicornis is sometimes met with.

Anomalies of the genito-urinary apparatus should always be sought for, for though most frequent among idiots, imbeciles, epileptics and the like, they are by no means rare

in other classes of degenerates and in degenerate families. In males defect of the testicles often coincides with general excess of growth in the whole body or in the lower extremities, such as is often produced by castration in man and lower animals.

Anomalies of the Skin.—Among the anomalies of the skin are to be mentioned adipose thickening; polysarcia; precocious and often abnormal development of the hairy system; hair along the spinal column; rudimentary tail; premature grayness; a glabrous chin in grown men; persistent lanuginous character of the hair; excessive growth of hair on the chin and breast in women; complete or partial decoloration of the hair (albinism, vitiligo); local or general hypertrichosis; partial or complete absence, or fœtal state of the nails; melanism of the skin; pigmentary or vascular naevi; molluscum; ichythyosis; vitiligo; albinism; pigmented spots.

Anomalies of Motor Function.—Delay in acquiring a knowledge of the proper use of muscles for walking, eating and the like may often be justly regarded as an index of degeneracy. Where ordinary etiological factors may be excluded, tremors, tics, epilepsy and nystagmus have a similar value. Even when not congenital they often indicate hereditary instability of the nervous system.

Anomalies of Sensory Function.—The numerous anomalies of function in connection with the eye have already been mentioned. Congenital deafness has also its significance. So too have hereditary forms of migraine and neuralgia. Certain defects or excesses in general cutaneous sensibility have been noted as frequent among degenerates. A general anæsthesia is not uncommon especially among lower classes of degenerates. In some instances there is hyperæsthesia.

Anomalies of Speech.—It may be questionable as to how far stammering and stuttering are to be looked upon as functional degenerative stigmata, but they are certainly found more often in children with a neuropathic inheritance

Female imbecile, aged 30 years, with hypertrichosis.

Male epileptic, aged 40 years, with glabrous face and chin and facial asymmetry.

than in children with good heredity. Delay in the acquisition of language, or complete or partial defect of speech, have more significance.

Anomalies of Genito-urinary Function.—Sexual irritability, impotence, sterility, and urinary incontinence must be considered as indices of neuropathic disposition. Retardation of puberty in both sexes, but especially in the male sex, is a noteworthy indication.

Anomalies of Instinct or Appetite.—It has been pointed out that among all degenerates there is a taste or appetite for certain foods or drugs which tends to favor their dissolution (alcohol, morphine, cocaine and the like). In many cases of inebriety the uncontrollable appetite is to be looked upon as a functional stigma of neuropathic inheritance. Gluttony, mercyism and the like are usually similar indications.

Miscellaneous.—A diminished resistance against external influences (such as strains of various kinds) and diseases is significant. Great precocity of intellectual development and of certain aptitudes, and morbid emotional conditions are among suspicious indications of a neuropathic basis.

The psychical stigmata of degeneracy need only the enumeration given above.

The Etiology of Hereditary Stigmata.

A few words should be said concerning the etiology of the stigmata of degeneration. When we come to investigate the causes which lead to their formation we meet with much difficulty. Usually we must look to modifications occurring during fœtal development, during the evolution of the child, modifications brought about by arrests or errors of development, not so much perhaps in the organs themselves (which show the effects) as in the central nervous system, in the nervous mechanism which governs heredity. As the evolution of our bodies as well as our minds depends upon the brain and spinal cord and the countless nerve filaments which radiate from them to every tissue, so the nervous system plays the most important part in the influences which have to do with

heredity. The nervous co-ordinations must be re-arranged by strong stimuli in order to reproduce the hereditary impulse. This is why traits acquired by us in our individual life-time are not apt to be inherited by our descendants. If a person loses an arm, his children are not deprived of that useful member, for the nervous mechanism of development which has for ages produced arms in their proper places and which is fixed in the powerful hereditary impulse of the race has not been changed. So in the breed of dogs whose tails have been cut off for countless generations, not one is born without a tail, because the nervous co-ordinations governing the evolution of the tail bear down with all the hereditary force of the race since its first beginning (when the tail existed though the animal was legless) to keep it in existence. If in some way we could reach the nervous mechanism which is responsible for the evolution of the tail, we might modify or even prevent its development. It is therefore some derangement of the nervous mechanism governing heredity which brings about deviations from the normal type, which gives rise to anatomical, physiological and psychic anomalies which we designate as the stigmata of degeneration. How is the nervous mechanism of heredity deranged? It may be readily and profoundly deranged in a variety of ways, for instance by poisons. Thus alcohol disarranges the nervous mechanism of heredity in such a way that the descendants may suffer from the drink-craving, from idiocy, insanity, epilepsy, hysteria, neurasthenia, from shattered nervous systems, for at least three generations, and in these unfortunates we find along with marked functional stigmata of degeneration, these actual physical deviations from the normal type which we call anatomical stigmata. But idiocy, insanity, epilepsy and the like are in themselves conditions which disarrange the nervous co-ordinations so profoundly as to affect the hereditary impulse and give rise to anatomical and functional stigmata in the descendants. What is bequeathed to the degenerate child is a fragile and unstable nervous constitution. The evidence of this in-

herited fragility of the nerve-mechanism may present itself as insanity, or it may be epilepsy, or it may be feeble-mindedness, or it may be criminal tendencies, or it may be simple nervousness or hysteria or certain kinds of headache or possibly only eccentricity. All of these disorders are more or less interchangeable and are merely proofs of an unstable nervous organization. Where such conditions do not develop they may still exist in a latent state and pass as a legacy to another generation. Whether the neuropathic state be manifest or latent, we are apt to find anatomical stigmata of degeneration present on careful examination.

Bibliography.

(References not made in the text).

Altabas: Visual Defects in Idiots (Med. Press and Circ., 1895, p. 234).
Binder: Arch. f. Psych., Vol. XX, p. 514.
Calori: Sull' Anat. del palato durá. Bologna, 1892.
Channing: N. Y. Med. Record, Oct. 3, 1891.
Charon: Thèse de Paris, July 2, 1891.
Clouston: The Neuroses of Development, 1894.
Féré: La Famille Neuropathique, Paris, 1894.
Fraenkel: Allg. Zeit. f. Psych., Vol, XXXVI.
Knecht: Allg. Zeit. f. Psych., Vol. XL.
Minot: Embryology.
Morel: Traité des dégénérescences.
Näcke: Arch. f. Psych., Vol. XXV, 1893.
Schwalbe: Arch. f. Psych., Vol. XXXVII, 1895, p. 633.
Stieda: Internationale Beiträge zur Wissenschaft. Med., Bd. I.
Talbot: Quoted by Farrar in "Irregularities of the Teeth," New York, 1888
Voisin: L'Idiotie, Paris, 1893.
Waldeyer: Ueber den harten Gaumen, Corr. Blatt der Deutsch. Anthrop. Gesellschaft, 1892.

60 West 50th Street,
New York.